






# AUTOMATIC BAR FEEDING DEVICE

**Patent number:** WO9506532  
**Publication date:** 1995-03-09  
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**Classification:**  
- international: B21F27/10; B21F23/00  
- european: B21F27/10; B21F23/00D  
**Application number:** WO1994EP02616 19940806  
**Priority number(s):** IT1993UD00169 19930830

## Also published as:

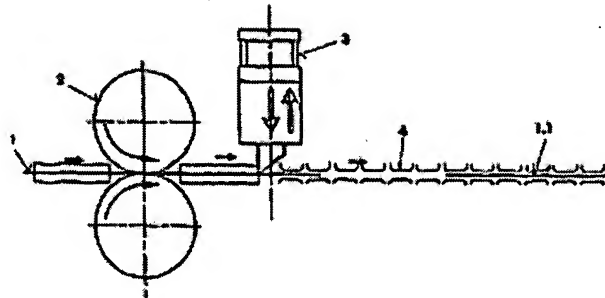
 EP0674553 (A1)  
 EP0674553 (B1)

## Cited documents:

 EP0482842  
 US3194935  
 EP0241449

## Abstract of WO9506532

This invention is concerned with an automatic feeding device for bar and/or metal rods for plants electrowelded normal or special meshes, shaped as per drawing, having its main characteristic to position at a required distance one or more pieces of said bars and/or rods. Device allows unilateral introduction continuous or by spaced pieces, transversally to the feeding sense of mesh construction. Continuous rod (1) is pushed by a bidirectional training device (2) and cut (1.1) to measure by the automatic shear (3), afterwards it is pushed through suitable gauged elastic guides (4), with the edge of the new bar against the end side of the previous bar (1.1), into required position on working surface.



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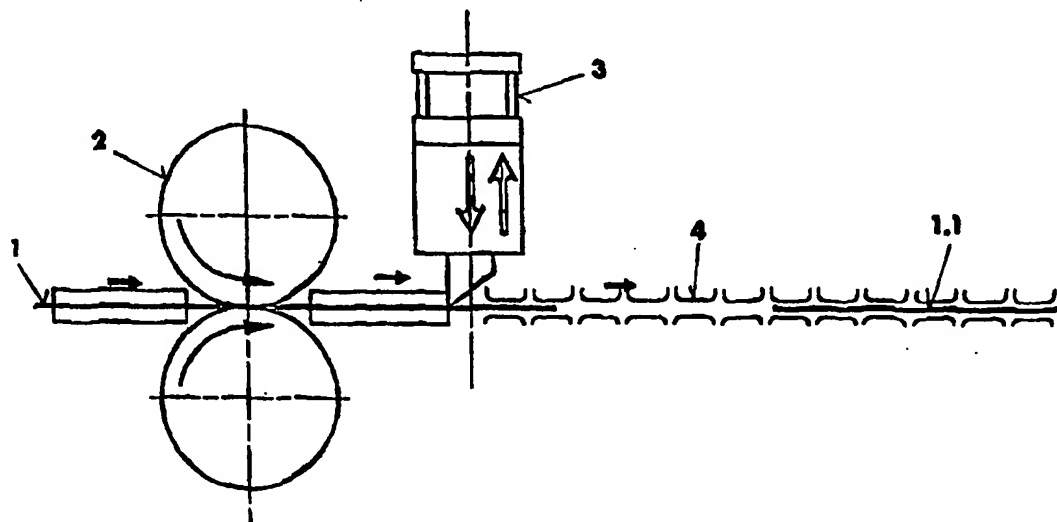
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6: <b>B21F 27/10, 23/00</b>	<b>A1</b>	(11) International Publication Number: <b>WO 95/06532</b> (43) International Publication Date: <b>9 March 1995 (09.03.95)</b>
(21) International Application Number: <b>PCT/EP94/02616</b> (22) International Filing Date: <b>6 August 1994 (06.08.94)</b> (30) Priority Data: <b>UD93A000169</b> <b>30 August 1993 (30.08.93)</b> <b>IT</b> (71)(72) Applicants and Inventors: <b>BERNARDINIS, Claudio</b> <b>[IT/IT]; Via A. Zardini, 6, I-33010 Treppo Grande (IT).</b> <b>ZEBELLONI, Carino [IT/IT]; Via Collosomano, 2/B,</b> <b>I-33030 Buia (IT).</b> (74) Agent: <b>CRAGNOLINI, Sergio; Viale Venezia, 277, I-33100</b> <b>Udine (IT).</b>		(81) Designated States: <b>AU, BR, CA, CN, JP, KR, PL, US,</b> <b>European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR,</b> <b>IE, IT, LU, MC, NL, PT, SE).</b> Published <i>With international search report.</i>

(54) Title: AUTOMATIC BAR FEEDING DEVICE



## (57) Abstract

This invention is concerned with an automatic feeding device for bar and/or metal rods for plants electrowelded normal or special meshes, shaped as per drawing, having its main characteristic to position at a required distance one or more pieces of said bars and/or rods. Device allows unilateral introduction continuous or by spaced pieces, transversally to the feeding sense of mesh construction. Continuous rod (1) is pushed by a bidirectional training device (2) and cut (1.1) to measure by the automatic shear (3), afterwards it is pushed through suitable gauged elastic guides (4), with the edge of the new bar against the end side of the previous bar (1.1), into required position on working surface.

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## 1. Description of the Patent entitled:

"AUTOMATIC BAR FEEDING DEVICE"

— O —

This invention is concerned with an automatic feeder for bars and/or  
5. metal rods on machines for the production of electrowelded mesh making  
plants having its particular feature to position, at a requested distance,  
one or more pieces of said bars and/or rods.

Device allows unilateral continuous introduction of bars, bars are  
continuous or in pieces, on their own positioning level, likewise for a  
10. bilateral positioning we need to have two devices which are opposite in  
position and in function.

Invention permits to build in automatic and quickly special electrowelded  
meshes (with orthogonal links) having general shapes with different  
geometrical shape, partial local reinforcements, empty spaces or project  
15. interruption.

At technical's state of things in case of construction of irregular  
electrowelded mesh construction that is on project drawing we operate  
manually and/or automatically on electrowelded normal mesh by cutting  
parts which are to be cut off and eventually add reinforcements partially.

20. This, besides forming a number of wastes and having a large spaces to  
work, this resulted not much economic because such operations need a  
long time and modifications influence on the unit price of product.

Therefore, we thought to make an automatic feeding device for bars  
and/or rods continuously to be applied on welding machines for

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1. electrowelded mesh, this allows to position in any point in the lateral orthogonal sense, according to the feeding sense of mesh, one or more bars of equal or different length. This way, besides avoiding staff intervention (therefore time and cost reduction) avoiding wastes because
5. we only use the necessari bar.

As mentioned, device is driven automatically therefore is capable to operate on project drawings.

- According to this invention, feeding device is composed by: a bar or metal rod training device, automatically driven suitable to operate in both
10. senses (feeding and return); a cutting device; a sequence spaced of a plurality of lined up guides opening by command and a plurality of levers or carriers for the positioning under the welding device of said bars or pieces of rods.

- Mechanical combination permits to position bars or pieces in a continuous
15. or spaced mode, automatically, by acting in synchrony and or in progression between all the parts mentioned.

- As a matter of fact, supposing that straight bar used comes from the unwinding of continuous metal wire coil, function sequences (in a possible solution) of the combination are the following: the training device,
20. bidirectional, feeds up bar of required size, through the spaced guides; afterwards, cutting device make the cutting to measure (if of total dimension, bar will be placed under the welding unit, if of partial dimension it will need to be moved straight according to drawing); for the rectilinear positioning of the piece entrainer at double rotation sense comes into action,

1. the edge of the new bar pushes forward the end of the piece by means of special guides, gauged and elastic, until reaching the position required and avoid any uncontrolled moving of said piece; then, entrainer inverts rotation sense and takes the new bar while the piece of wire remains still
5. into the reached position; entrainer takes totally or partially the new bar of said size equal to the positioning distance space between both bars; afterwards the cutting device comes into action and cuts the bars; now, previous phase will be more or less repeated until reaching the rectilinear definitive positioning of bars according to drawing; in conclusion, orthogonal
10. carriers come into action automatically which move, from the opening guides (subject to springs) to the welding device bars positioned (we will have the union of lateral bars of this invention with the longitudinal ones fed by other machines).

A first variation to this invention is concerned with the possibility to

15. adjust the dimension of diameter of bars of automatic training device and the possibility to use opening guides, spaced, rectilinear, invertable of the same or of different diameter and/or opening guides having more parallel housings of a same or of different diameter.

A second variation to this invention is the possibility to make the whole

20. feeding combination mobile in order to position under command the rods or wire pieces in parallel on a construction level of mesh.

A third variation to this invention is concerned with the possibility to use the feeding device in couple, in contrast, on the same line or on parallel lines in order to operate for the construction of large electrowelded meshes.

1. A forth variation to this invention is concerned with the possibility to make many electrowelded side by side meshes previously cut, as a matter of fact feeding device can cut, push and position many rod pieces on the same trajectory, each one of them will be part of a single electrowelded
5. mesh.

Above mentioned characteristics will be better understood and pointed out while other will appear from the following detailed description of a non limited realization example, in the four attached drawings, in which:

- Fig.1 shows a plan view a special electrowelded mesh, with orthogonal
- 10. links, shaped, with empty spaces and eventual local reinforcements according to drawing;
- Fig.2 shows a side view of bar positioning device into welding zone pointing out movement of the carrier from release opening guide;
- Fig.3 shows a schematic front view of the training device, the cutting
- 15. and the guides pointing out the first work phase, to be the cut of a piece of bar;
- Fig.4 shows a front view, as per Fig.3, the second work phase that is the pushing of the piece of wire with the new bar through the spaced guides until reaching requested position;
- 20. - Fig.5 is a front view, as per Fig.3 and 4, of the third phase that is the call back of continuous bar leaving the piece in position;
- Fig.6 is a front view, as per Fig.3, 4 and 5, of the fourth phase consisting in the cut to measure of the second piece of wire on the same direction (for example x-coordinate);

1. - Fig.7 shows a front view, as per Fig.3, 4, 5 and 6, the fifth phase, that is, the pushing of the second piece of wire with the edge of the new bar;
- Fig.8 shows a front view, as per previous Fig.3, 4, 5, 6, and 7, the sixth phase, of call back of the new bar leaving in position the second piece of
5. wire. The following phase will be the positioning of the first and the second piece under the welding device. Besides, the drawing points out an example of electrowelded mesh composed by discontinuous bars and spaced in order to form an empty space.

According to the invention and in conformity with a realization mode

10. of the automatic feeding device of bars or steel rods in a continuous mode, coming from a skein or coils, it includes an automatic entraining device (2), adjustable in order to operate on different diameters of wire and to push it in both directions: frontwards and backwards. Following is the automatic cutting device (3) which cuts to measure rods of any length,
15. of maximum dimension possible for machine or partial pieces. Following is a set of special guides (4), spaced, and elastically half-moon opening, with two holes of different diameter for the passing of relevant steel rods. They are interrupt and spaced to permit the action of lever or carrier (6) orthogonal to the wire feeding, these move and position wire under the
20. electrodes of the welding device (7) which will link wire (1.1 - 1.2) to the orthogonal wire (8) already present as a mesh component.

The whole feeding device is capable to cut to measure wire (1.1 - 1.2) and to position it at a requested distance making it pass through the holes of the opening guides (4), through the push of the edge of rear wire (1)



1. on the edge of the cutted wire (1.1). Once such position is reached entrainer calls back wire (1), leaving wire (1.1) in position, and waits for the next cut to measure (1.2) on the same line or for a new line, positioning operation is repeated as already described with the particularity that second piece
5. can be positioned distant from the first, on the same line, leaving space according to drawing. After this, carries (6) come into action by moving them under the electrodes for the effective welding.

Afterwards, cycle will be repeated following the construction of mesh according to the drawing.

10. Mesh which may be normal or elaborated with perimetric and inner shapings, for example empty spaces (5) local reinforcements (1.1 and 1.2).

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## C L A I M S

1st. Automatic feeding device for bars, particularly suitable for the construction of electrowelded meshes shaped according to a drawing whose particular feacture is that of including different mechanical devices automatically commanded through program, in sinchrony and/or progression in order to place bars and/or straight metal rods coming from skeins or coils, of. variable length, at required distances in a continuous or discontinuous mode, on a work level or transversally to the forming sense of the electrowelded meshes.

10. Said feeder is composed by: an entraining (2) for continuous wire (1) or bars capable to operate in both directions (frontwards or backwards); a cutting device (3), also adjustable in the feeding direction of wire, for the cutting to measure of rods; a set of special guides (4), gauged and elastic, keeping rod movement under control, straight and spaced, having one or several passing holes relevant to rods and formed by two opening parts, in order to permit orthogonal movement of wires (1.1 - 1.2) through carriers (6) which place them under the welding device (7) to be linked with relevant rods (8) orthogonal composing mesh.

Positioning of entire or pieces of rods (1.1 - 1.2) at required distances, is made through the push of the edge of rod piece with the head of new bar, moved forward by entrainer, through passing holes of opening guides (4), which simply hold it and keep it always stopped in to the position required. Afterwards, entrainer inverts motion and calls beck new bar leaving previous piece of rod in position for a new cycle (which can be

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1. on the same trajectory or line in continuous or leaving spaces, or on a new line).

2nd. Feeding device according to the first claim is characterized by the fact that entrainer above operating automatically in both directions, frontward and backward, is adjustable, consequently it can operate on rods having different diameter.

3rd. Feeding device according to one or several previous claims is characterized by the fact that guides, with one or several passing holes of different or of same diameter, anyhow gauged in order to stop bars, are made in two parts one of which can be lifted in order to permit lateral output, that is orthogonal to the passing hole direction and to the rod feeding direction.

4th. Feeding device according to one or several previous claims characterized by the fact that it operates laterally, transversally to the feeding direction of mesh construction, and can be made fix or mobile operating unilaterally or also side by side, at variable or fixed distance, in order to operate parallelly under independent command.

At last, in case of large construction of electrowelded mesh operate on the same line in contrast.

5th. Feeding device according one or several previous claims characterized by the fact that it is capable to pre-cut electrowelded meshes, because it can feed transversally several pieces of rods, one after the other, on the same trajectory. Consequently mesh, composed by transversal and longitudinal rods, once welding is over, will be interrupted,

1. already cut in stripes side by side.

6th. Feeding device according to one or several previous claims characterized by the fact to be suitable for machines producing metal electrowelded meshes, normal or shaped, and on other machines operating on metal wires or rods as for example stirrup machines or bending machines for building purposes and selectioning units for rods of different length.

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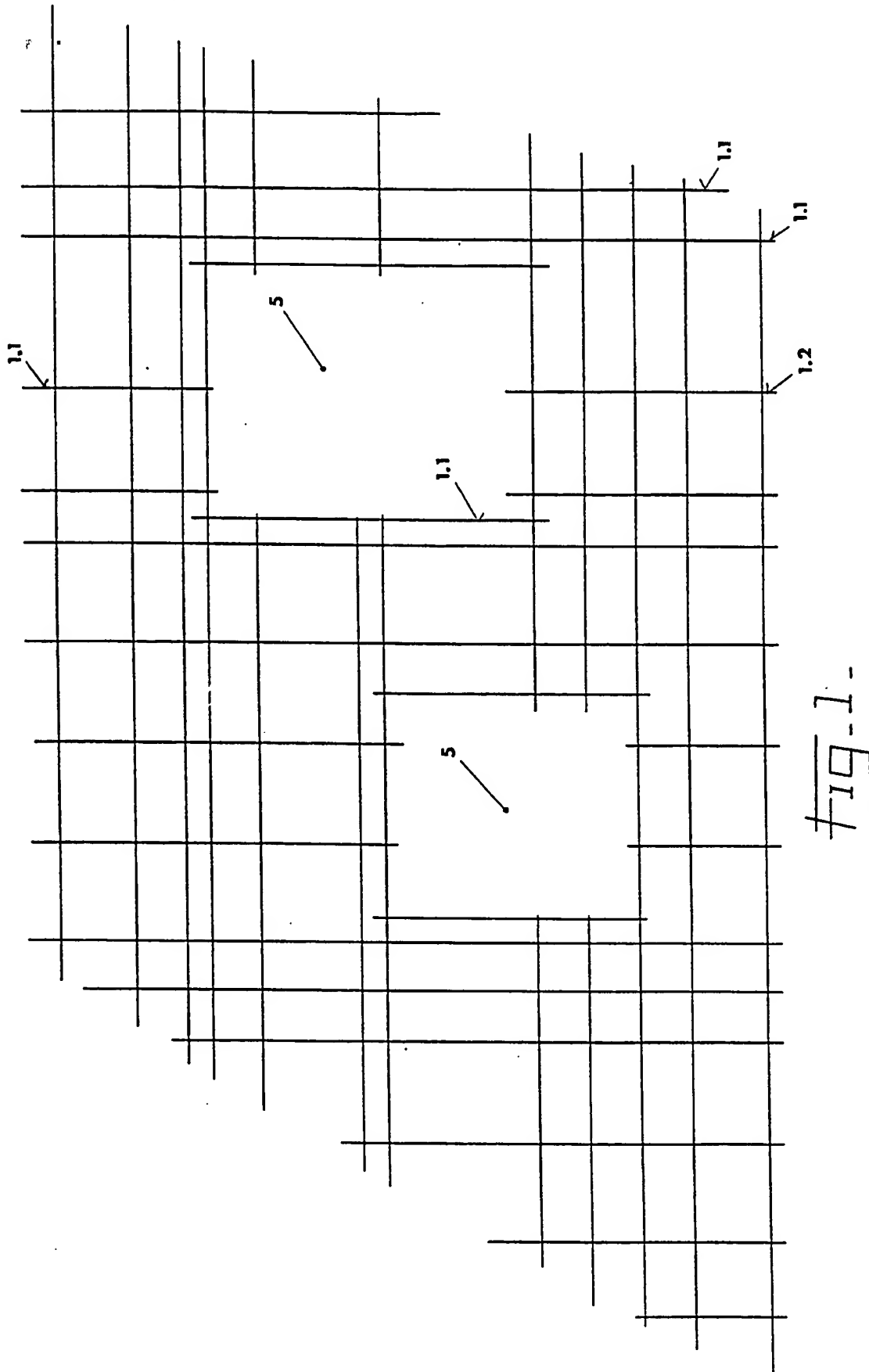
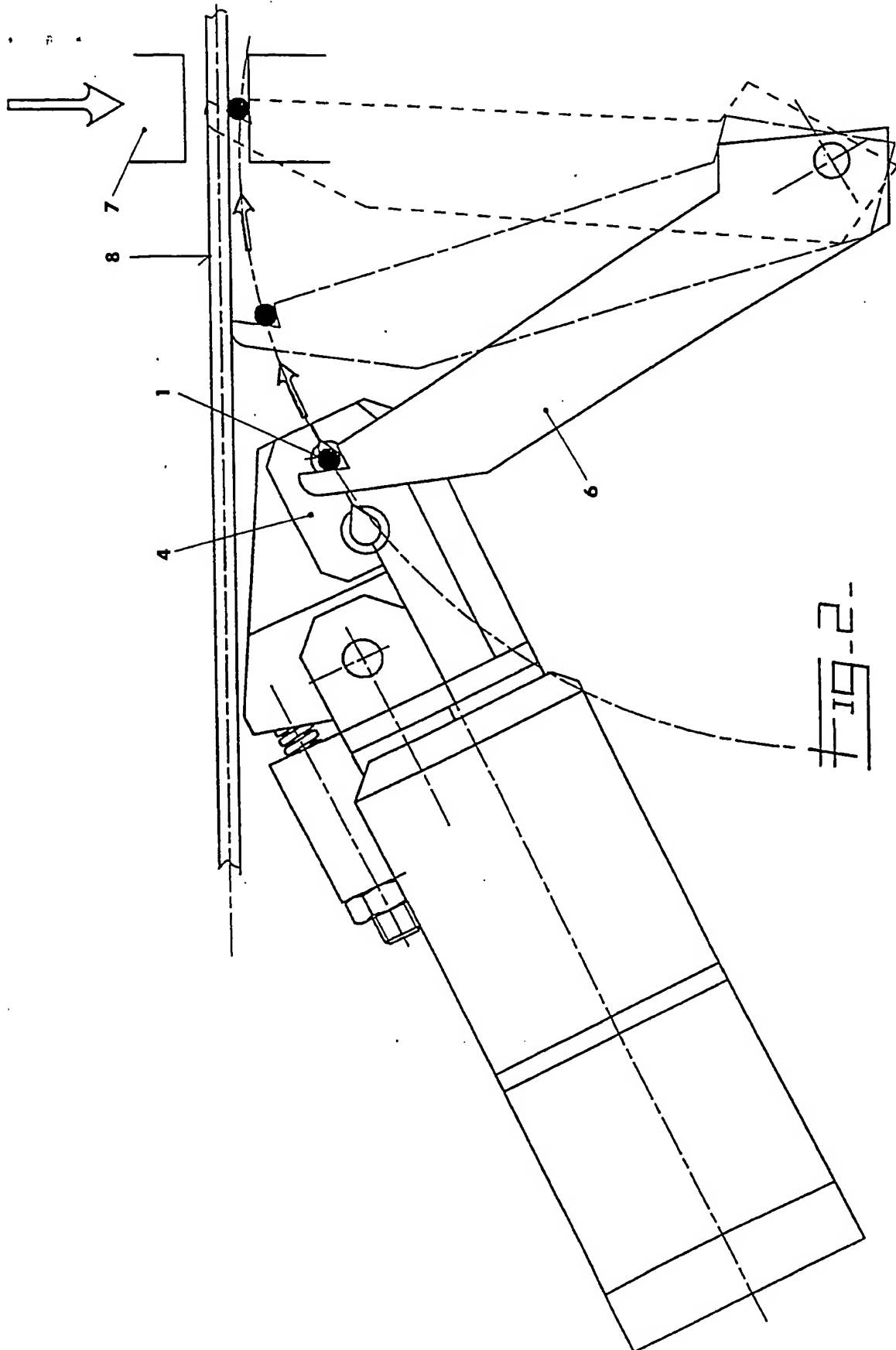
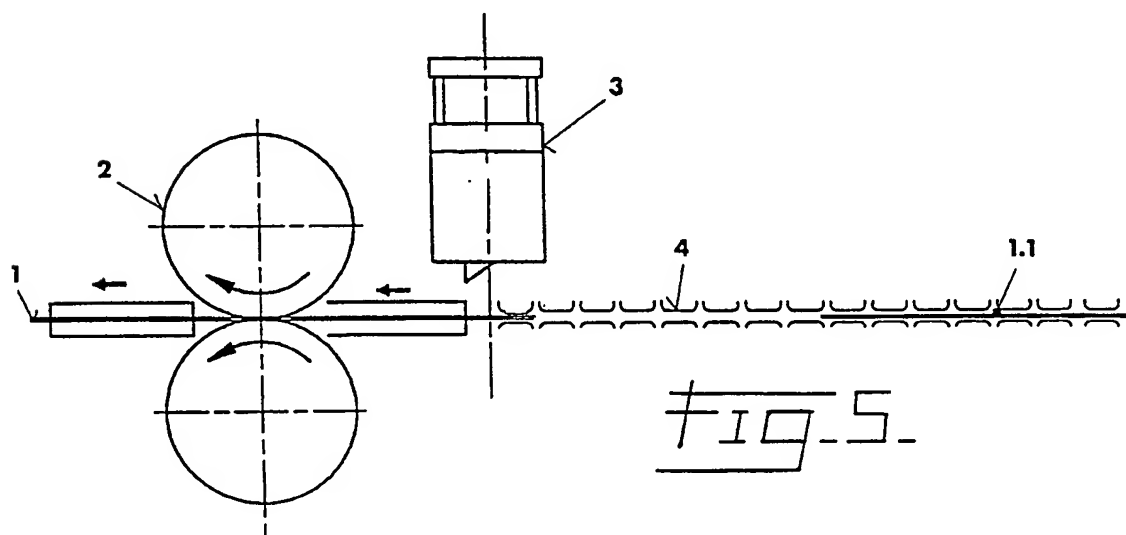
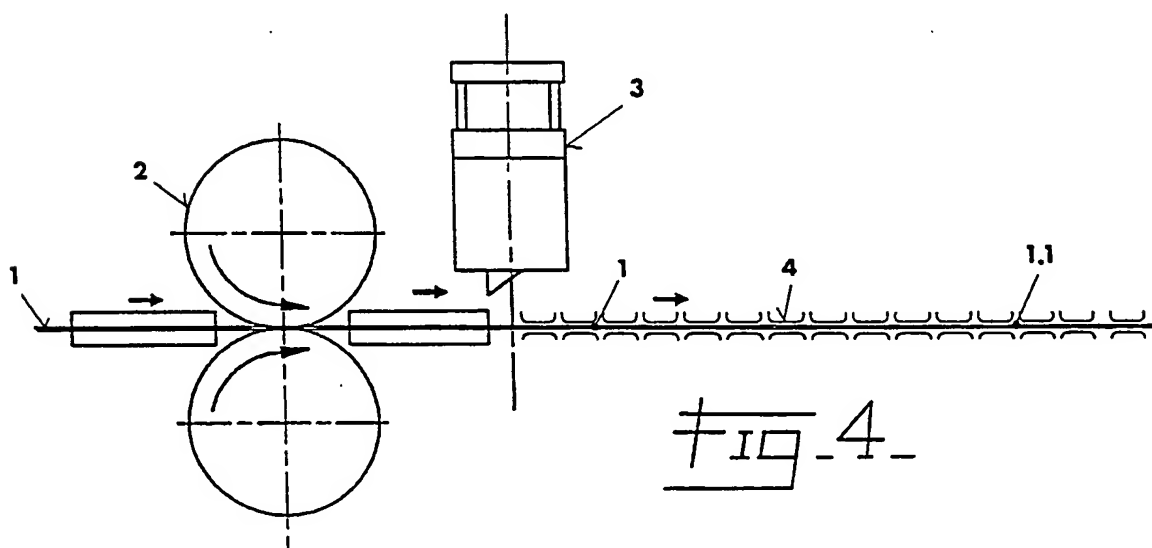
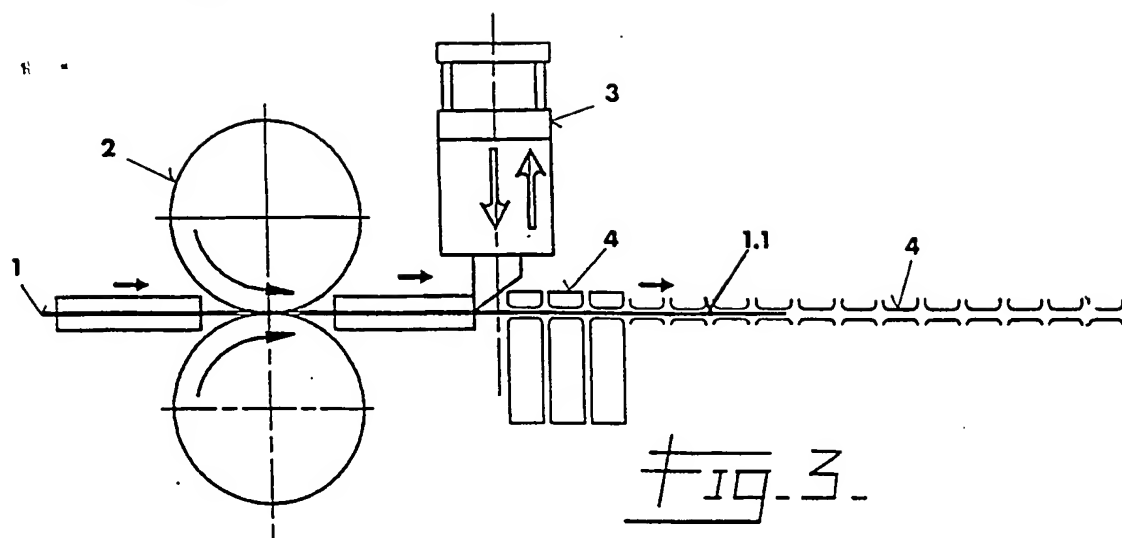
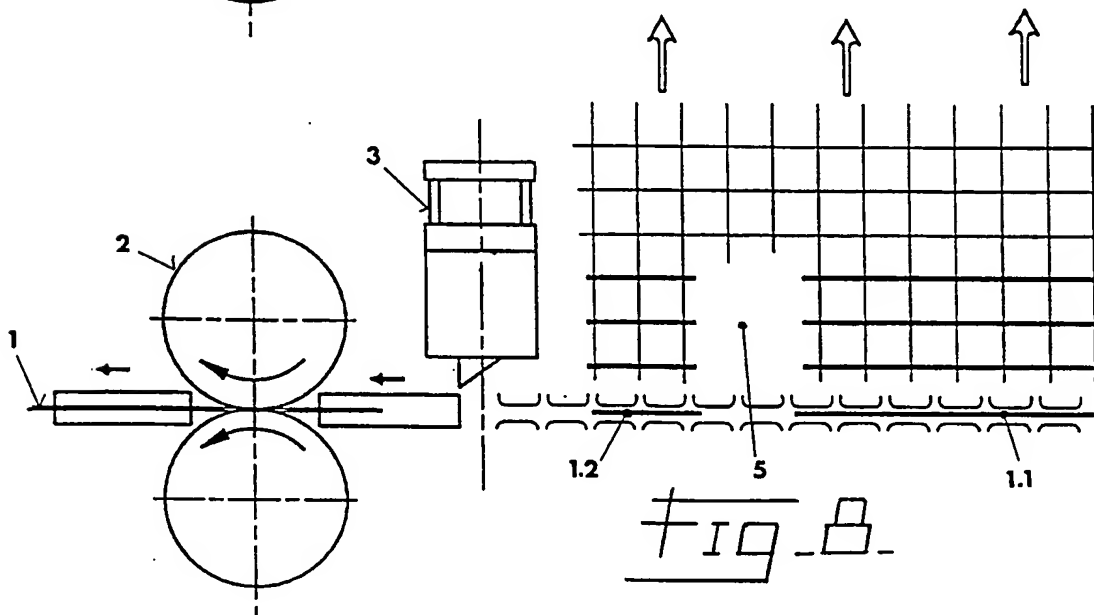
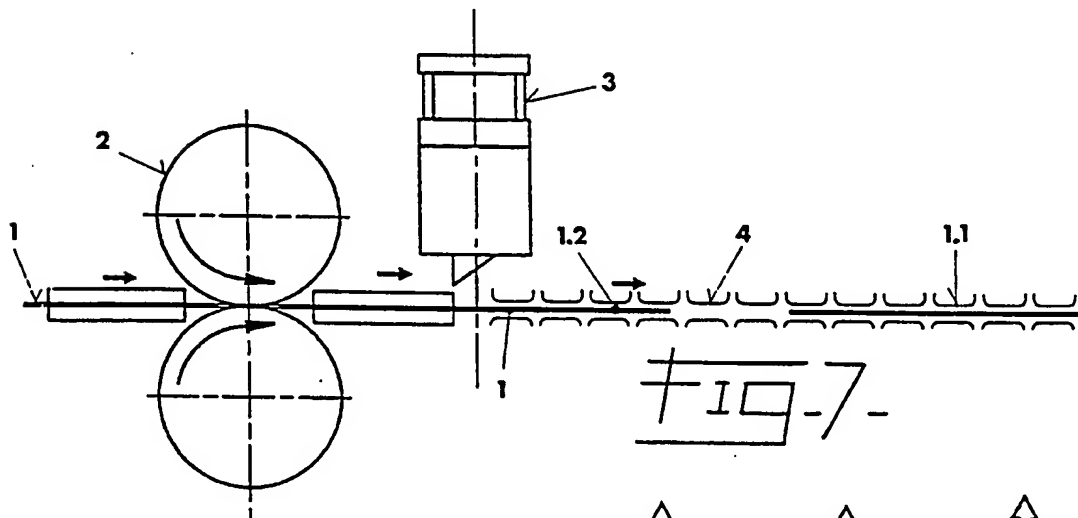
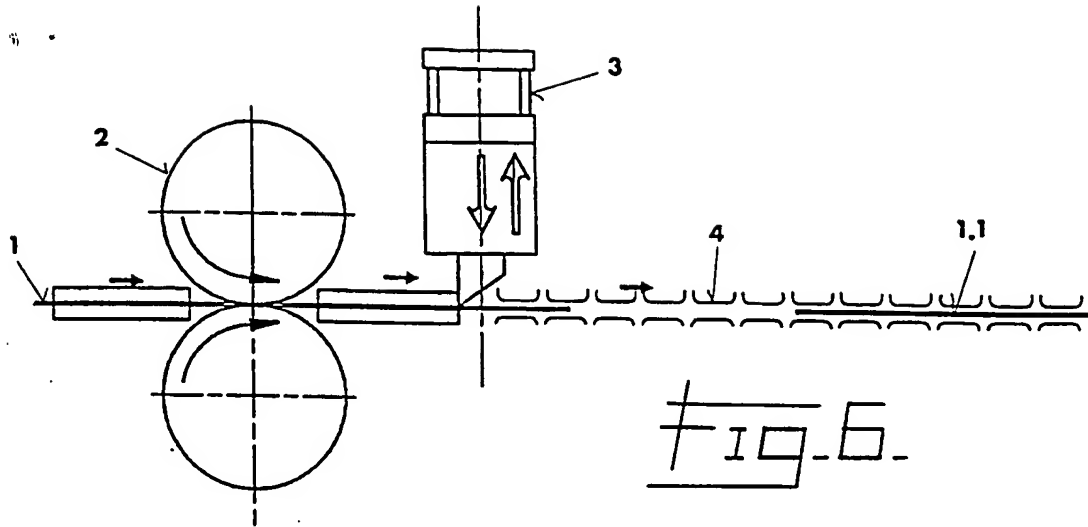


Fig. 1









## INTERNATIONAL SEARCH REPORT

Inter. Application No

EP 94/02616

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 B21F27/10 B21F23/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B21F B21D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 482 842 (TAMMER ELEMENTTI OY) 29 April 1992 see column 4, line 21 - column 5, line 17; figures ---	1,4-6
A	US,A,3 194 935 (STOECKEL) 13 July 1965 see column 3, line 35 - line 73; figures 2,4 ---	1,3,4
A	EP,A,0 241 449 (EVG ENTWICKLUNGS- U. VERWERTUNGS- GESELLSCHAFT M.B.H.) 14 October 1987 -----	

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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EP 94/02616

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0482842	29-04-92	NONE	
US-A-3194935		NONE	
EP-A-0241449	14-10-87	AT-A- 384969 US-A- 4748309	10-02-88 31-05-88